



# Southern California Forest Health Protection



**Report No: SC07-01**

**File Code: 3400  
February 20, 2007**

**DATE OF TRAVEL:** February 12 – 14, 2007

**LOCATION:** Charlton Flats, Chilao, Bandido, Horse Flat campgrounds (Los Angeles River Ranger District, T2N R11W sections 2,3 and T3N R11W sections 22, 23, 26, 27, 34, 35), Crystal Lake Recreation Area (Glendora Ranger District, T3N R9W sections 20, 21, 29, 28), Angeles National Forest

**PURPOSE:** Evaluation of Carbaryl treatment on high value trees

**AGENCY PERSONNEL:** Beverly M. Bulaon, Entomologist; Andi Koonce, Supervisory Pathologist; Steve Bear, Forest Silviculturist; Amy C. Jones, Resource Assistant; Karen Fortus, Resource Officer

**EXECUTIVE SUMMARY:** Forest Health Protection, along with Angeles National Forest district personnel, evaluated the effectiveness of carbaryl spray treatments on high value trees. Ponderosa, Jeffrey, and Coulter pines at five high-use administrative sites were treated in the fall of 2004. Selected trees for treatment were mainly of large diameter, potential for hazard, and location next to roads or streams. Over 900 trees were sprayed with Sevin XLR® (2% carbaryl formulation) with a ground-based sprayer. Sevin XLR® has been proven as an effective insecticide to repel bark beetles from attacking selecting trees for at least two seasons (Fettig et al. 2006). Evaluation of most treated trees found no evidence of insect activity. Bark beetles did recently kill one to two untreated trees on the outskirts of some campgrounds that were not treated; however, no attacks were detected on adjacent treated trees. Carbaryl treatments proved effective in protecting selected trees and retaining site integrity. Infested tree removal and some density thinning were also implemented to improve overall stand conditions.

Healthy Forests Make a World of Difference

---

**Background:** Starting around 2001, the San Bernardino National Forest began to experience increasing bark beetle activity over large acreages in the forest. Overstocked stand conditions and four years of unprecedented drought rendered many trees highly susceptible to bark beetle attack (Merrill 2002). By 2004, the forest recorded more than half million acres with dead trees.

Forest resource managers on the Angeles National Forest, which borders on the west side of San Bernardino NF, applied for Forest Health Protection suppression funding in 2003 to prevent potential mortality, and mitigate current loss of pines due to bark beetles in several of their high-use campgrounds. Four campgrounds (Charlton, Chilao, Bandido, Horse Flats) on Los Angeles River Ranger District and Crystal Lake Recreational Area on Glendora Ranger District were prioritized for treatment. Carbaryl spray treatments should provide protection against further bark beetle attack for at least two seasons after application.

In the fall of 2004, approximately 900 trees were sprayed with Sevin XLR® (2% carbaryl formulation) in high value locations. The same contractor applied all treatments according to label instructions using a ground-based high-pressure sprayer with lift that allowed direct spraying up to 115 feet on the bole. Limbs or branches that impeded access to bole were pruned; however, most trees required minimal branch removal.

**Observations:** District personnel evaluated campsites soon after application and found only a few trees missed that were designated for treatment. Sites were not thoroughly examined until this service visit. Heavy precipitation in 2005 made many roads inaccessible. We assessed most of the treated trees in all sites and found no evidence of bark beetle activity. Bark beetles did attack one to two trees in the periphery of treated areas, Bandido and Horse Flats particularly – some adjacent to treated trees, but no spillover attacks occurred.

In Charlton Picnic area where carbaryl sprays were applied, bark beetle activity appeared to have immediately ceased following treatments. Stand density was greatly reduced in this area, mainly due to the high number of already infested trees that needed removal. Thinning and brush removal is still ongoing, which should benefit overall stand conditions.

Crystal Lake Recreation Area contained a higher proportion of larger mature pines, Ponderosa and Jeffrey, and many of which lined paved roads. Spray treatments here proved also effective, no bark beetle activity was detected. Above treatment area #4, two large Jeffrey pines that were not sprayed were recently attacked (2006 presumably). Karen indicated that this particular area consistently loses between one to four trees annually and is chronically problematic due to insects or disease. Based on the current conditions of residual trees and its past history, it would be beneficial to further investigate this area for other forest health issues that may be contributing to its tree decline and mortality.

**Comments:** In summary, spray treatments protected all high-value trees and helped prevent further large-scale losses to bark beetles. Timing of carbaryl treatments were appropriate as beetle populations were still very high in 2004, and application was properly performed as no insect activity was noted on selected trees. Infested tree removal is helpful as it removes current beetle populations in the stand, but past suppression efforts of this kind have been unsatisfactory. Western Pine beetle, the most predominant beetle found infesting trees in southern California, can produce several overlapping generations per year and has been recorded to fly great distances to find hosts. It is best recommended that prior thinning to reduce resource competition and improve residual tree vigor would be more resilient to potential bark beetle outbreaks.

Currently, bark beetle activity is minimal within and in the vicinity of all sites examined and therefore, reapplication of spray treatments would be unnecessary. Continued monitoring of these sites would help keep up awareness if new bark beetle activity was noted on treated or adjacent trees as carbaryl efficacy is due to expire this season. Drought conditions have been predicted to return to the L.A. basin, so these sites should be monitored very closely this spring and summer for increasing bark beetle activity. Forest Health Protection emergency funds may be available if the need arises to re-treat high value trees.

Forest Health Protection would like to express its gratitude to Steve, Amy, and Karen for implementing this project, escorting us around the forest, and providing all necessary information for this report. We hope to continue working together in partnerships through funding and technical assistance. Please contact us if you have any further questions or concerns.

**Reference:**

Fettig, C.J. et al. 2006. Effectiveness of Bifenthrin (Onyx) and Carbaryl (Sevin SL) for protecting individual, high-value conifers from Bark Beetle Attack in the Western United States. *Journal of Economic Entomology* 99(5): 1691-1698.

Merrill, Laura 2002. San Bernardino National Forest, The Science behind the dying trees. Forest Health Protection, *in house report*. October 2002.